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ASSIGNMENT BOOKLET 5A

MAT1040 Mathematics Preparation 10
Module 5: Section 1 Assignment

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Date Assignment Submitted: _____	(If label is missing or incorrect) File Number: _____
Time Spent on Assignment: _____	Module Number: _____

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Assignment Grading: _____

Graded by: _____

Date Assignment Received:

Student's Questions and Comments

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MATHEMATICS
Preparation 10

Module 5

Shape and Space

Learning Technologies Branch

Assignment Booklet 5A

Alberta LEARNING

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Summary

	Total Possible Marks	Your Mark
Section 1 Assignment	20	

Teacher's Comments

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Parents	
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Mathematics Preparation 10
Module 5: Shape and Space
Assignment Booklet 5A
Section 1 Assignment
Learning Technologies Branch
ISBN 0-7741-1816-4

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ASSIGNMENT BOOKLET 5A
MODULE 5: SHAPE AND SPACE
SECTION 1 ASSIGNMENT

Your mark for this module will be determined by how well you do your assignments in the Assignment Booklets.

This Assignment Booklet is worth 20 marks out of the total 100 marks for Module 5.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

(20)

Section 1 Assignment: The Pythagorean Theorem

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

(3)

1. Determine the value of the following square roots or cube roots. Where necessary, leave your answer as a fraction not a decimal.

a. $-\sqrt{144}$

b. $\sqrt{\frac{16}{81}}$

c. $\sqrt[3]{1331}$

(2)

2. Estimate the value of $\sqrt{110}$ without using a calculator. Explain the reasoning for your estimation.

_____

_____

_____

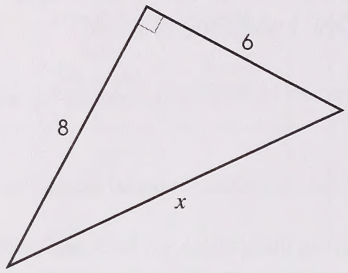
(1)

3. Give an example of a number with a natural-number square root.

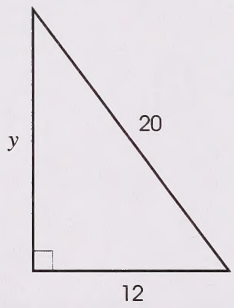
_____

4. Determine the value of the unknown side in each triangle.

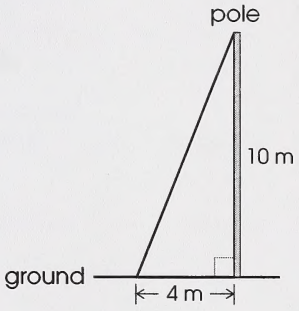
(2) **a.**



(2) **b.**



(2) **5.** A guy wire is attached to the top of a 10-m pole and attached to the ground 4 m away from the base of the pole (as shown in the diagram). Determine the length of the guy wire if 2 m of wire is required to attach the wire to the pole and to the ground. Round your answer to the nearest tenth.



6. Solve the following equations for all values of x.

(1) **a.** $x^2 = 0.81$

(2) **b.** $4x^2 - 17 = 83$

(3) c. $\frac{x^2}{2} = \frac{x^2}{6} + 27$

(2) **7.** If you try to evaluate $\sqrt{-16}$ using a calculator, you will get an error message. Explain why it is not possible to take a square root of a negative number.

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Assignment Booklet 5A
Module 5
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ASSIGNMENT BOOKLET 5B

MAT1040 Mathematics Preparation 10
Module 5: Section 2 Assignment and Final Module Assignment

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Time Spent on Assignment: _____	Module Number: _____

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Assignment Grading: _____

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MATHEMATICS
Preparation 10

Module 5

Shape and Space

Learning Technologies Branch

Assignment Booklet 5B

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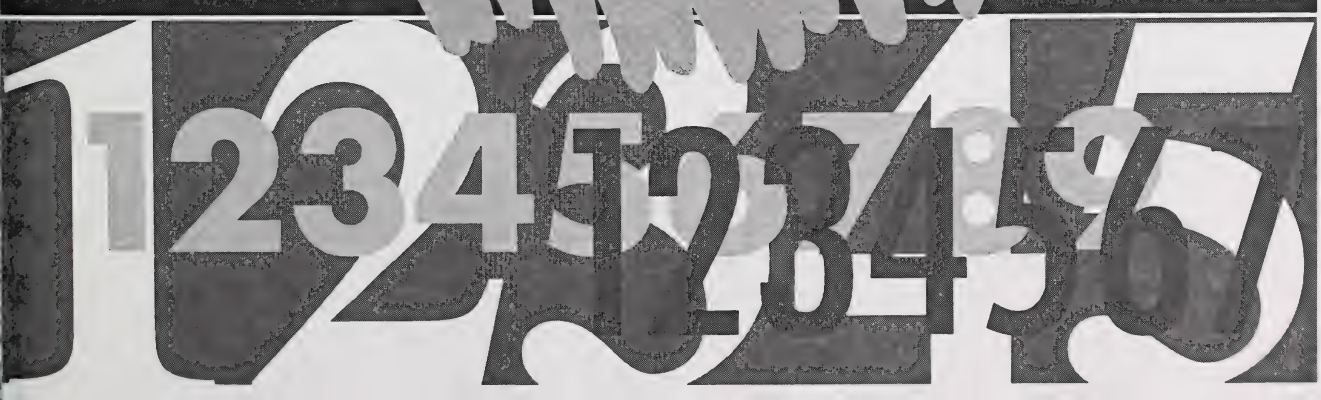

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Summary

	Total Possible Marks	Your Mark
Section 2 Assignment	40	
Final Module Assignment	40	
	80	

Teacher's Comments

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Parents	
General Public	
Other	

Mathematics Preparation 10
Module 5: Shape and Space
Assignment Booklet 5B
Section 2 Assignment and Final Module Assignment
Learning Technologies Branch
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ASSIGNMENT BOOKLET 5B
MODULE 5: SHAPE AND SPACE
SECTION 2 ASSIGNMENT AND FINAL MODULE ASSIGNMENT

Your mark for this module will be determined by how well you do your assignments in the Assignment Booklets.

This Assignment Booklet is worth 80 marks out of the total 100 marks for Module 5.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

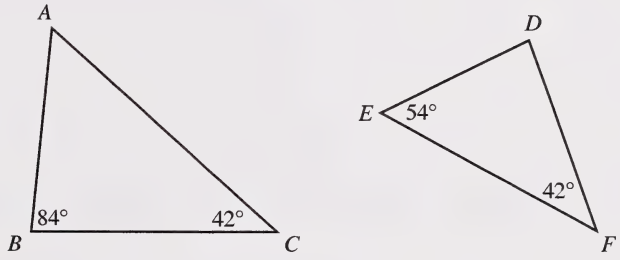
(40)

Section 2 Assignment: Triangles and Trigonometry

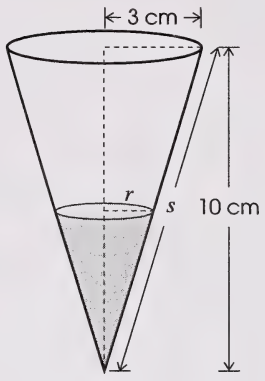
Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

(2)

1. Explain whether or not ΔABC is similar to ΔEDF.



2. A drinking cup is in the shape of an inverted circular cone (as shown in the diagram). The radius of the cup is 3 cm, and the height is 10 cm.



(2) **a.** If the drinking cup is filled to a depth of 5 cm with water, determine the value of r.

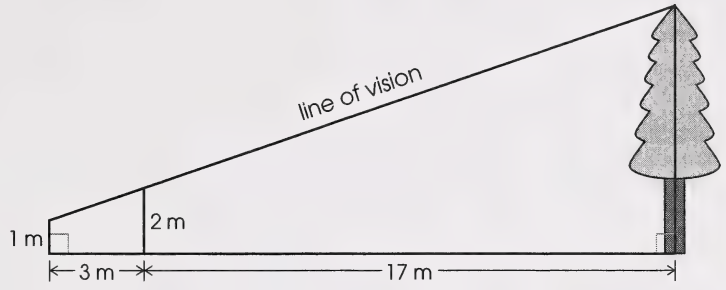
(2) **b.** Determine the slant height, s. Round your answer to the nearest tenth.

(4) **3.** Draw the following angles; then classify the angle as obtuse, right, straight, reflex, or acute.

a. 50° **b.** 130°

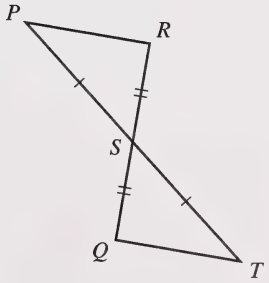
(4)

4. Sandra kneels on the ground and looks over a 2-m fence up to the top of a tree. Sandra's eyes are 1 m from the ground and 3 m from the fence. If the fence is 17 m from the tree, determine the height of the tree. Round your answer to the nearest tenth.



(2)

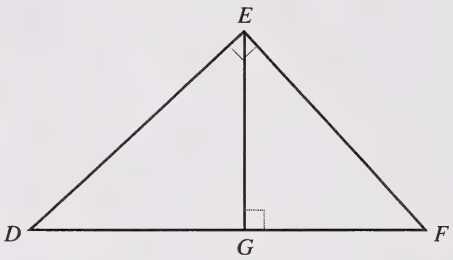
5. State the congruence condition that allows you to conclude $\Delta SPR \cong \Delta STQ$. Explain.



(2) **6.** Determine $\angle A$ for each of the following equations. Round your answers to the nearest degree.

a. $\sin A = 0.2233$ **b.** $\tan A = 1.6$

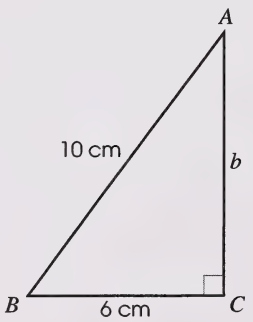
7. Provide the unknown portion of the ratios using the diagram of ΔDEF.



(2) **a.** $\sin D = \frac{EF}{\quad}$ $\sin D = \frac{\quad}{DE}$

(2) **b.** $\cos F = \frac{\quad}{DF}$ or $\cos F = \frac{\quad}{EF}$

8. Use ΔABC to answer the following questions.



(2) **a.** Determine the value of $\angle B$. Round your answer to the nearest degree.

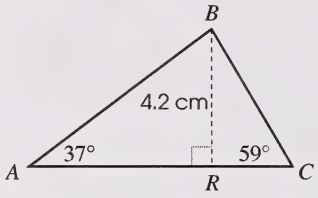
(2) **b.** Determine the value of b using the Pythagorean Theorem.

(2) **9.** You know $\cos A = \frac{\text{adj}}{\text{hyp}}$. If you let A be any angle between 0 and 90°, you would notice that $\cos A$ is always between 0 and 1. Explain why $\cos A$ is always between 0 and 1.

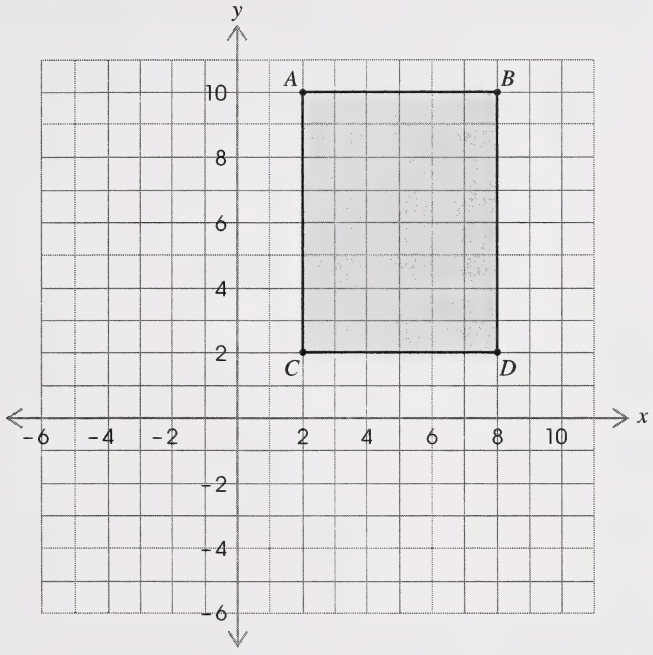
(4) **10.** Benny is flying a kite. At a particular time, the angle of elevation to the kite was approximately 25°. By that time, Benny had let out a total of 150 m of string. To the nearest metre, how high was the kite at that time? What assumptions are you making?

(5)

11. Calculate the area of ΔABC. Recall that the area of a triangle is $\frac{1}{2}bh$, where b is the base of the triangle and h is the height (or altitude) of the triangle. Round your answer to the nearest tenth.



(2) **12. a.** Use a dilatation to reduce rectangle *ABCD* so that each side is one-half its original length.



(1) **b.** Complete the mapping rule for the dilatation you used in question 12.a.

$(x, y) \rightarrow$

40

Final Module Assignment

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

(1)

1. Using your calculator, determine $\sqrt{75}$ to the nearest tenth.

(2)

2. Calculate the following. Use a calculator, if necessary.

a. $-\sqrt{25}$

b. $\sqrt{\frac{169}{25}}$

3. Solve the following equations, if possible.

(2)

a. $x^2 = 625$

(2)

b. $5x^2 - 4 = x^2 + 60$

(2) **c.** $2x^2 = 3x^2 + 25$

(3) **4.** Joe leaves the town of Anywhere and drives directly north 100 km. Sue leaves from the town of Anywhere and drives directly west 200 km. How far apart are Joe and Sue? Round your answer to the nearest kilometre.

(3) **5.** An extension ladder 3.6 m long rests against a house. The top of the ladder just reaches the bottom of the window. If the base of the ladder is 1.0 m from the house and the house is perpendicular to the level ground, how far up the side of the house is the window? Round your answer to the nearest tenth.

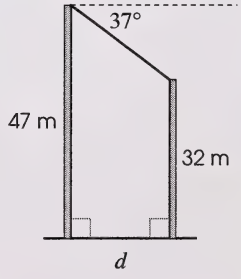
(4) **6.** Use your calculator to determine the value of $\angle A$. Round your answer to the nearest degree.

a. $\sin A = \frac{5}{16}$

b. $\tan A = 3.5$

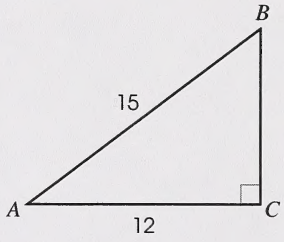
(3) **7.** A moving truck has a 400-cm long ramp that can be pulled out from the back of the truck. The top of the ramp is 130 cm from the level ground. Determine the angle that the bottom of the ramp makes with the ground. Round your answer to the nearest degree.

(4) **8.** The two vertical masts of a sailing ship have heights 47 m and 32 m. The angle of depression from the highest mast to the other is 37°. Find the distance, d, between the two vertical masts. Round your answer to the nearest metre.



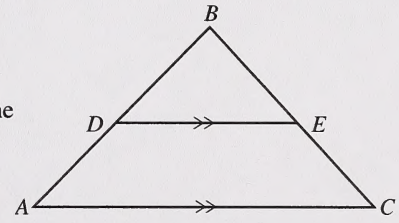
(3) **9.** You have worked with the sine ratio $\left(\sin A = \frac{\text{opposite}}{\text{hypotenuse}}\right)$ and the cosine ratio $\left(\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}\right)$. You have noticed that both $\sin A$ and $\cos A$ lie between 0 and 1 if $\angle A$ lies between 0 and 90°. Does $\tan A$ also lie between 0 and 1? Explain.

(3) **10.** Determine the value of the smallest angle in ΔABC to the nearest degree. Within your calculation, explain how you decided which angle to calculate.



11. Use the diagram to answer questions 11.a. and 11.b.
Note: DE is parallel to AC.

(2) **a.** If $BE = 40$, $BC = 75$, and $DE = 56$, determine the value of AC.



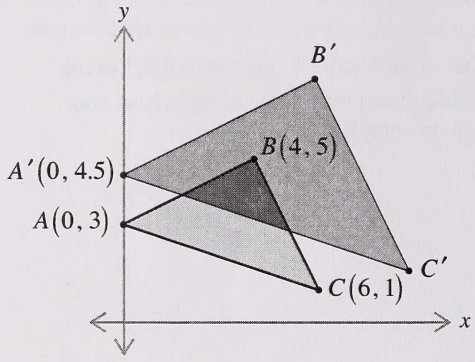
(2) **b.** To determine the measurement of the common angle, $\angle B$, what information would you need?

_____

_____

_____

12. In the diagram given, $\Delta A'B'C'$ is the dilatation image of ΔABC.



(2) **a.** Write the mapping rule to represent the dilatation from $\Delta ABC \rightarrow \Delta A'B'C'$.

(2) **b.** Determine the coordinates of B' and C'.

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